

with a check that covered 27 total claims (7 independent claims and 20 dependent claims). The cancellation and addition of claims in this amendment has resulted in 19 total claims (5 independent claims and 14 dependent claims). Thus, no additional claim fee is believed to be required.

A. Objection

Claim 25-27 stand objected to for a numbering informality. The Applicants have corrected this informality either by cancellation of claims or by amendment. Therefore, reconsideration and withdrawal of the objection are respectfully requested.

B. 35 U.S.C. § 103(a) – Claims 1-7, 12-16, and 23-28

Hembree in view of Domadia

Claims 1-7, 12-16, and 23-28 stand rejected under 35 U.S.C. § 103(a) as being obvious over the U.S. Patent No. 5,783,461 issued July 21, 1998 to David Hembree (hereinafter “the Hembree patent”) in combination with U.S. Patent No. 5,949,137 issued September 7, 1999 to Domadia, et al. (hereinafter “the Domadia patent”) (Office Action, pages 2-7).

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 1, from which claims 2 and 4-7 either directly or indirectly depend (claim 3 having been canceled without prejudice), has been amended to more clearly define the invention as a non-reflow electrical contact with a solder ball between a substrate and a motherboard. This amendment finds support in the specification at page 6, line 21.

It appears that these claims have been rejected in view of the Hembree patent alone without the Domadia patent, rather than in combination as was indicated in the Office Action at page 2. The Hembree patent is directed to “[a] temporary package for testing semiconductor dice”. The presently claimed invention is directed to removably attaching a substrate to a motherboard for the fabrication a microelectronic device rather than for temporary/testing purposes. The Hembree patent neither teaches nor suggests a non-reflow electrical contact with a solder ball between a substrate and a motherboard. Thus, claims 1, 2, and 4-7 are believed to be allowable over the Hembree patent. Therefore, reconsideration and withdrawal of the Section 103(a) rejection of claims 1, 2, and 4-7, as amended, are respectfully requested.

With regard to claims 6 and 7, the Office Action at page 4 states essentially that the Hembree patent fails to specify the dimensions such as a width and shape of contact having a diameter of the solder ball and shape of a semispherical surface, but that such would be a matter of design choice. The Applicants strongly disagree with the Office Action’s contention. The presently claimed invention deals with non-reflow electrical contact in the fabrication of a microelectronic device rather than contact for temporary/testing. Thus, an efficient contact of the solder balls between the components becomes much more critical than would be with mere testing. Thus, the presently claimed invention contemplates designs to achieve such contact. As

stated above, “there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings.” *In re Vaeck*. The Office Action has not shown any suggestion or motivation for the fabrication of such designs. At a minimum, as stated in the M.P.E.P. 706.02(j), the “examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). The Applicants do not believe that the Office has carried its burden in this instance.

Claim 12, from which claims 13-16 either directly or indirectly depend, has been amended to more clearly define the invention as a non-reflow electrical contact with a solder ball between a substrate and a motherboard. This amendment finds support in the specification at page 6, line 21.

It appears that claims 12, 15, and 16 have also been rejected in view of the Hembree patent alone without the Domadia patent, rather than in combination as was indicated in the Office Action at page 2. Again, the Hembree patent is directed to “[a] temporary package for testing semiconductor dice”. The presently claimed invention is directed to removably attaching a substrate to a motherboard for the fabrication a microelectronic device rather than for temporary/testing purposes. The Hembree patent neither teaches nor suggests a non-reflow electrical contact with a solder ball between a substrate and a motherboard. Thus, claims 12, 15, and 16 are believed to be allowable over the Hembree patent. Therefore, reconsideration and withdrawal of the Section 103(a) rejection of claims 12, 15, and 16, as amended, are respectfully requested.

Claims 13 and 14 have been rejected over the Hembree patent in combination with the Domadia patent. However, neither the Hembree patent nor the Domadia patent teach or suggest a non-reflow electrical contact with a solder ball between a substrate and a motherboard. Thus, the combination thereof does not render that present claims obvious. Therefore, reconsideration and withdrawal of the Section 103(a) rejection of claims 13 and 14 are respectfully requested.

With regard to claims 23-26 (claims 24 having been deleted and dependent claims 25 and 26 having been rewritten as independent claim 32 and dependent claim 33), the Office Action has stated at page 6 that they stand rejected as explained for claims 5 and 1 (the Hembree patent only). Claim 23 has been amended to specific that the substantially vertical sidewalls of the recess are also plated with the conductive material. This is neither taught nor suggested by the Hembree patent and the Domadia patent, alone or in combination.

Claims 25 and 26 have been rewritten as independent claims 32 and 33 to expressly claim the semispherical design for the recessed contact. This is also neither taught nor suggested by the Hembree patent or the Domadia patent, alone or in combination. Furthermore, as discussed with regard to claims 6 and 7, these designs are not merely a matter of design choice (see previous discussion). Therefore, reconsideration and withdrawal of the Section 103(a) rejection of claims 23-26, as amended, are respectfully requested.

With regard to claim 27, the Office Action 6 states that the Hembree patent fails to specify using a resilient material disposed between the substrate and the conductive material layer. However, the Office Action then states that it is conventional in the art and cites to FIG. 3c and 3d along with cols. 5 and 6 of U.S. Patent 5,736,356 issued April 7, 1998 to Salman Akram (hereinafter “the Akram patent”). However, the Applicants could not find any reference

within the Akram patent with regard to using resilient material layers under the conductive material layer to improve the interconnection reliability, as claimed by the Office Action. Thus, the Applicants consider claim 27 to be allowable. Therefore, reconsideration and withdrawal of the Section 103(a) rejection of claim 27 are respectfully requested.

With regard to claim 28, the Office Action at page 7 only states that claim 28 is rejected as explained for claims 1, 5-7, and 23-27. However, claim 28 relates to a conductive material that is layered over a recess such that a void is formed in the recess. The Applicants could find nothing in the cited patents that even remotely teaches or suggests such a design. Thus, Applicants believe that claim 28 is allowable.

With regard to the newly added claims, claims 29-31, either directly or indirectly, depend from claim 1. As claim 1 is believed to be allowable over the art, claims 29-31 are likewise believed to be allowable over the cited patents. The allowability of claims 32 and 33 has been previously discussed.

In view of the foregoing remarks, the Applicants request favorable reconsideration and allowance of the application.

Please forward further communications to the address of record. If the Examiner needs to contact the below-signed attorney to further the prosecution of the application, the contact number is (503) 712-1682.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Robert G. Winkle', written over a horizontal line.

Robert G. Winkle
Attorney for Applicants
Reg. No. 37,474

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